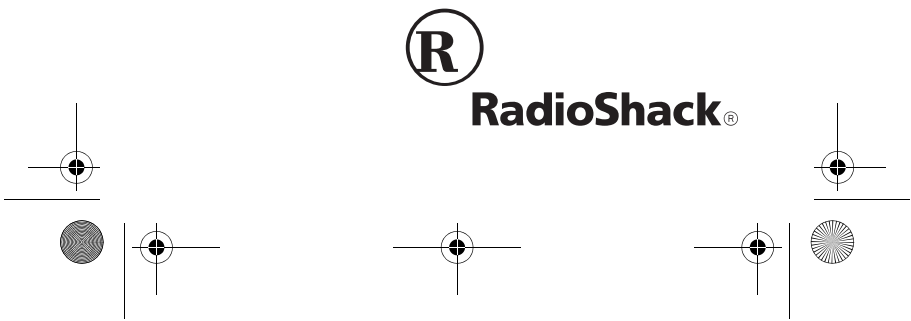


Please read before using this equipment.

**20-Range Auto Ranging
Digital Meter**



FEATURES

Your RadioShack 20-Range Auto-Ranging Digital Meter is a portable compact multimeter that is ideal for field, lab, shop, and workbench applications. Its $3\frac{3}{4}$ -digit digital display means it can display up to 3,999 units. It measures up to 1000V DC, 750V AC, DC and AC current up to 400 mA, and resistance up to 4 M Ω .

Important:

- Completely read this manual before you use the meter.
- If you are not familiar with multimeters and testing procedures, we suggest you read *Using Your Meter* (available at your local RadioShack store) before using the meter.

Here are some of the features that make your new multimeter a real winner.

Full Auto-Ranging — the meter automatically selects a range when you measure voltage, resistance, or current, making the meter easier and safer to use.

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Diode Check Function — lets you safely check semi-conductors for open, shorted, or normal junctions.

Full Auto-Polarity Operation — protects the meter and gives valid measurements even when you connect the leads in reverse polarity.

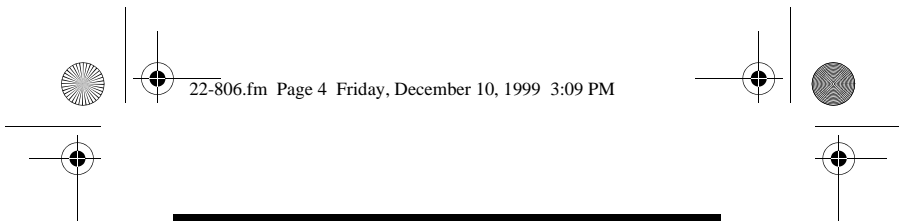
Low Battery Indicator — shows when you need to replace the batteries.

Auto Power Shut-Off — helps conserve battery power by automatically turning the meter off if you do not change any settings for 30 minutes.

Overload and Transient Protection — help protect the meter from overvoltage in most ranges.

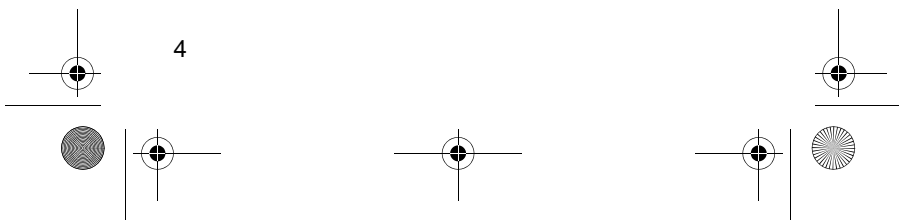
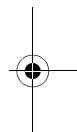
Latest Integrated Circuit (IC) and Display Technology — ensures reliability, accuracy, stability, and ease of operation.

UL Listed — your meter has passed the stringent safety tests required by Underwriters Laboratories.



Notes:

- The UL mark does not indicate that this product has been evaluated by Underwriters Laboratories for the accuracy of its readings.
- Your meter requires two AA batteries (not supplied) for power.



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SAFETY PRECAUTIONS

We have taken every precaution in designing this meter to ensure that it is as safe as we can make it. But safe operation depends on you, the operator. We recommend that you follow these simple safety rules:

- Never apply voltage to the meter that exceeds the limits given in the specifications. Never apply more than 1000V DC or 750V RMS AC between the input jacks and ground.
- Use extreme caution when working with voltages above 100V. Always disconnect power from the circuit you are measuring before you connect test leads to high-voltage points.
- Never connect to a source of voltage when you select the diode check, resistance measurement, or current measurement function.
- Always discharge any capacitors of the circuit under test before you attach test leads.
- Always turn off power and disconnect the test leads before you replace the meter's batteries or fuse.
- Never operate the meter unless its back cover is in place and fully closed.

- This equipment is rated for installation Category II (maximum 3600 VA)
- Because many AC/DC sets have a potentially hot chassis, be sure the top of your workbench and the floor underneath it are made of non-conductive materials.
- This meter is fully calibrated and tested. Under normal use, no further adjustment should be necessary. If the meter requires repair, do not try to adjust it yourself. Take it to your local RadioShack store.

WARNINGS:

- USE EXTREME CAUTION IN USE OF THIS DEVICE. IMPROPER USE OF THIS DEVICE CAN RESULT IN INJURY OR DEATH. FOLLOW ALL SAFEGUARDS SUGGESTED IN THIS OWNER'S MANUAL IN ADDITION TO NORMAL SAFETY PRECAUTIONS IN DEALING WITH ELECTRICAL CIRCUITS. DO NOT USE THIS DEVICE IF YOU ARE UNFAMILIAR WITH ELECTRICAL CIRCUITS AND TESTING PROCEDURES.




- IF THIS EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.
- TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.
- FOR INDOOR USE ONLY.

SPECIAL PANEL MARKINGS

For your safety, we have added special markings to the meter's panel and warning label to remind you of the measurement limitations.

**750V
MAX**


To avoid electrical shock or instrument damage, do not connect the common input terminal (– **COM** jack) to any source that exceeds 750 volts with respect to earth/ground.

	Caution: Risk of electric shock! Refer to the complete operation instructions.
1000V DC 750V AC 400 mA MAX	The maximum voltage that this meter can measure is 1000V DC or 750V AC. The maximum amperage that this meter can measure is 400 mA DC and AC.
	Caution: Be extra careful when making high-voltage measurements; DO NOT TOUCH TERMINAL OR PROBE ENDS.
CAT II	This equipment is rated for installation Category II (maximum 3600 VA).
	The meter is protected by double insulation.

SPECIFICATIONS

Display LCD 3¾-digit digital display

DC VOLTS

Measurement Ranges: 400 mV–4 V–40 V–400 V

1000V $\pm 1.0\%$ of reading,
 $\pm 0.2\%$ of full scale, ± 1 in last digit
(Max. Measurement: 1000 V)

AC VOLTS

Measurement Ranges: 400 mV–4 V–40 V–400V

750V at 50/60Hz $\pm 1.3\%$ of reading,
 $\pm 0.5\%$ of full scale, ± 3 in last digit
(Max. Measurement: 750 V RMS at 50/60 Hz)

45–100 Hz at 400 mV Range $\pm 1.8\%$ of reading,
 $\pm 0.5\%$ of full scale, ± 3 in last digit

45–500Hz at 40 V Range $\pm 1.8\%$ of reading,
 $\pm 0.5\%$ of full scale, ± 3 in last digit

DC CURRENT

40–400 mA $\pm 1.8\%$ of reading,
 $\pm 0.2\%$ of full scale, ± 2 in last digit

AC CURRENT

40 mA at 50/60Hz $\pm 2.0\%$ of reading,
 $\pm 1.0\%$ of full scale, ± 3 in last digit

400 mA at 50/60Hz $\pm 2.0\%$ of reading,
 $\pm 0.5\%$ of full scale, ± 3 in last digit

RESISTANCE

400 Ω –4k–40k–400k–4M Ω $\pm 1.8\%$ of reading,
 $\pm 0.2\%$ of full scale, ± 1 in last digit
(+5 digit maximum at 400 Ω range)

MISCELLANEOUS

Zero Offset 10 digit maximum

Automatic Power Off 30 minutes after
last selection

Range Control Fully Auto-Ranging

Low Battery Indicator: **BATT** appears when battery
voltage drops below approx. 2.4 V

Input Impedance 10M Ω (DCV/ACV),
More than 100 M Ω on 400 mV DC/AC range

Overrange Indication **.OL** (overload)

Caution: When **.OL** flashes, it indicates that the measurement exceeds the absolute maximum reading. Unless you are measuring resistance, exceeding the maximum limits of any range can damage the meter.

Polarity Automatic
Operating Temperature 41° to 104°F (5° to 40°C)
Storage Temperature -4° to 140°F (-20° to 60°C)
Relative Humidity 80% (Maximum) for
Temperatures Up to 87.8°F (31°C),
Decreasing Linearly to 50% at 104°F (40°C)
Power Source Two AA Batteries
Power Consumption 10 mW (Typical)
Dimensions (HWD) $2\frac{3}{4} \times 5 \times 1\frac{3}{16}$ Inches
(70 mm \times 127 mm \times 30 mm)
Weight (without batteries) $5\frac{1}{8}$ oz (145 g)
Included Accessories Test Leads,
Extra 500mA 250V Ceramic Fuse

Note: Specifications are typical; individual units might vary. Specifications are subject to change and improvement without notice.

PREPARATION

INSTALLING/REPLACING BATTERIES

Your meter requires two AA batteries for power. For the best operation and longest life, we recommend RadioShack alkaline batteries.

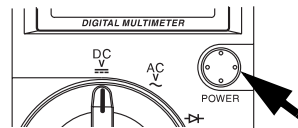
Warnings:

- To avoid electrical shock, disconnect both of the meter's test leads from any equipment before you install or remove the meter's batteries.
- Do not operate your meter until batteries are properly installed and the battery compartment cover is in place and secured.

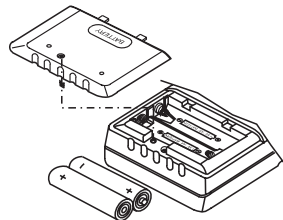
Cautions:

- Use only fresh batteries of the required size and recommended type.
- Do not mix old and new batteries, different types of batteries (standard, alkaline, or rechargeable), or rechargeable batteries of different capacities.

1. Press **POWER** to turn off the meter if it is on, then disconnect the test leads if they are connected.



2. Use a Phillips screwdriver to loosen the screw in the battery compartment cover, then lift off the cover.



3. Install the batteries in the battery compartment as indicated by the polarity symbols (+ and -) marked inside.
4. Replace the cover and secure it with the screw.

When **BATT** appears on the left side of the display, replace both batteries.

BATT

DIGITAL MULTIMETER

Warning: Dispose of batteries promptly and properly.

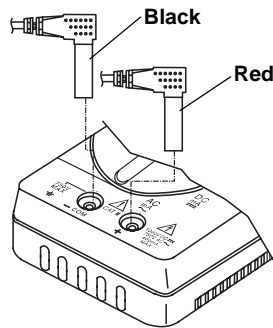
Cautions: Always remove old or weak batteries. Batteries can leak chemicals that can destroy electronic parts.

If you are not going to use the meter for a few weeks, remove the batteries.

CONNECTING THE TEST LEADS

The test leads supplied with your meter are rated for 1000 volts. Use only test leads of the same rating with the meter. You can order replacement leads from your local RadioShack store.

Plug the red test lead's right-angled end into the meter's **+** jack, then plug the black test lead's right-angled end into the meter's **-COM** (common) jack.



Warning: Always turn off power to the circuit you are about to measure before you probe the test leads into high-voltage points.

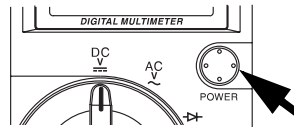
Caution: Be sure to select the correct function before you touch the test leads to the circuit or component to be tested.

USING THE METER

For the most accurate readings, the air temperature should be between 18°C and 28°C (65°F and 83°F), with a maximum relative humidity of 80%.

Warning: Do not try to measure voltage greater than 1000V DC/750V RMS AC.

To use the meter, press **POWER** to turn it on. All the display elements briefly appear.



Use the selector to switch between the meter's functions. Then connect the test leads to the circuit you want to measure. To measure different circuits, see "Making Measurements" on Page 21.

Caution: If **.OL** (overload) appears, the value you are measuring exceeds the meter's maximum range. This is normal when you measure resistance of a diode, or when you do not have the leads connected to a component. If you are measuring voltage or current, immediately disconnect the probes from the circuit.

Your meter automatically sets itself to the range that gives the best reading. See the unit of measure on the display to distinguish the range. For example, **mV** appears in the 400 mV range and **V** appears in the 400 V range. Also, note the position of the decimal. For example, if **.000V** appears, the meter is set to measure less than 4 volts. If **0000V** appears, the meter is set to measure up to 1000 volts.

Read the range in volts, ohms, or amps as indicated by the position of the decimal point.

Switch Setting	Range	Display
DC/ACV	400 mV	ddd.d mv
DC/ACV	4V	d.ddd v
DC/ACV	40V	dd.dd v
DC/ACV	400V	ddd.d v
DCV	1000V DC	dddd v

Switch Setting	Range	Display
ACV	750V RMS AC	ddd v
DC/AC mA	40 mA	dd.dd mA
DC/AC mA	400 mA	ddd.d mA
k Ω	400 Ω	ddd.d Ω
k Ω	4 k Ω	d.ddd k Ω
k Ω	40 k Ω	dd.dd k Ω
k Ω	400 k Ω	ddd.d k Ω
k Ω	4 M Ω	d.ddd M Ω
Diode	4V (Fixed Range)	d.ddd V

Notes:

- The display might show a phantom reading in some DC and AC voltage ranges when the test leads are not connected to a circuit. This is normal. The high input sensitivity produces a “wandering” effect. When you connect the test leads to a circuit, a real measurement appears.
- Your meter conserves power by automatically turning off about 30 minutes after the last time you changed settings (even if you are making measurements). To turn the meter back on, press **POWER**.

MAKING MEASUREMENTS

MEASURING DC/AC VOLTAGE

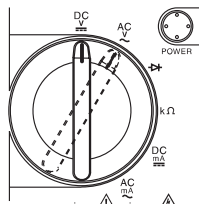
Warnings:

- Never clamp a test lead to a hot wire (usually red, black, or blue in AC wiring circuits). If one lead is clamped to a hot wire and you touch the meter's other lead, you could receive an electric shock.
- The maximum input limit for voltage measurement is 1000V DC or 750 V AC (RMS). To avoid electrical shock and damage to the meter, never try to measure a DC voltage above 1000 volts or an AC voltage above 750 volts RMS.

Note: When you select the setting $\frac{DC}{V}$ or $\frac{AC}{V}$, the display might show small changes in lower ranges (such as 400 mV or 4V) before you connect the test leads to a circuit under test. This is normal. A high-input impedance produces this "wandering" effect. When you connect to a circuit, you get the normal accurate measurement.

Follow these steps to measure DC or AC voltage.

1. Press **POWER** to turn on the meter.
2. Set the selector to $\overline{\text{DC}}$ (to measure DC voltage) or \sim (to measure AC voltage).



3. Touch the test leads to the circuit you want to test. The meter automatically moves to the range that gives the best reading.

When you measure AC voltages, \sim and V or mV appear on the display.



When you measure DC voltages, **V** or **mV** appears on the right side of the display.



123.2 mV

DIGITAL MULTIMETER

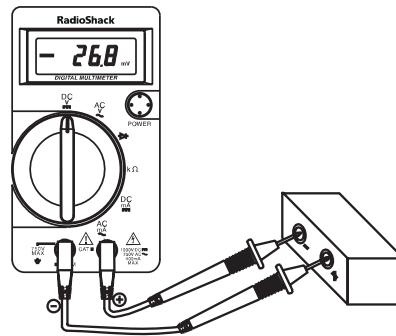
Note: In the 400V and 400 mV ranges, the decimal point appears in the same position (one place to the left). To distinguish between the two ranges, **mV** appears in the 400 mV range, and **V** appears in the 400 V range.



25.3 mV

DIGITAL MULTIMETER

If you connected the black test lead to a point in the circuit that has a higher voltage potential than the point where you connected the red test lead, **-** appears on the left side of the display when you measure DC voltage.



Hint: When you use the meter to probe for a voltage in a high-voltage circuit, we recommend you do not try to position both test leads at once. Instead, use an insulated alligator clip (not supplied, available at your local RadioShack store) to clamp one test lead to the circuit's neutral or ground lead (usually a bare, green, or white lead in AC wiring circuits). Then place your free hand in your pocket or behind your back and probe for voltages with the other test lead. This helps prevent you from accidentally touching a hot wire, since you need only concentrate on one test lead.

MEASURING AC VOLTAGE RIDING ON A DC SOURCE BIAS

To measure an AC voltage superimposed on a DC voltage source bias, you must first measure the DC and AC voltages separately, then compute the peak voltage using this formula:

$$\text{Peak voltage} = \text{DC voltage} + \frac{\text{AC voltage}}{.707}$$

Warning: To avoid injury to yourself or damage to your meter, never try to measure an AC voltage that is riding on a DC source bias where the peak voltage exceeds 100V with respect to earth ground.

Caution: Never try to measure any voltage more than 30V AC on a DC source bias.

1. Press **POWER** to turn on the meter.

2. To measure the DC voltage, set the selector to DC V . Then touch the test leads to the circuit you want to test. The display shows the DC voltage.



3. Disconnect the test leads from the circuit.
4. To measure the AC voltage, set the selector to AC V , then connect a 0.1 microfarad/100V Mylar capacitor in series with the positive terminal of the voltage source and the positive (+) test leads.
5. Touch the negative (–) test lead to ground. The display shows the AC voltage.
6. When you finish measuring the AC voltage, disconnect the capacitor you connected in Step 4.

MEASURING THREE-PHASE AC VOLTAGE

We designed this meter primarily to measure household AC voltages. If you want to measure 3-phase, line-to-line voltages, please note the following:

- Because of the dangers inherent in measuring three-phase circuits, we strongly recommend you do not use this meter for such application.
- The actual voltage can be greater than the circuit's rated line-to-ground voltage.

To determine if a line-to-line 3-phase voltage exceeds the rating of this meter, multiply the rated line-to-ground voltage by 1.732 (the square root of 3).

For example, if the rated line-to ground voltage is 462 volts, the line-to-line voltage is $462 \times 1.732 = 800\text{V AC}$.

Since the voltage in the example exceeds the meter's rating (see "Specifications" on Page 10), you should not connect the meter to this circuit or to any equipment connected to the circuit. Doing so could present a shock hazard to you, and could also damage the meter.

MEASURING DC/AC CURRENT

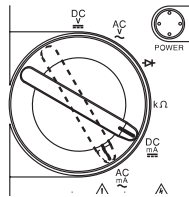
To measure current, you must break the circuit and use alligator clips to connect the test leads to two circuit connection points. The connection must be in series with the circuit under test.

Caution: Never connect the leads across a voltage source. Doing so can blow the fuse in the meter or damage the circuit under test. The maximum input limit for DC/AC current measurement is 400 mA.

Follow these steps to measure current:

1. Press **POWER** to turn on the meter.

2. Set the selector to $\overline{\text{DC}}$ (to measure DC current) or \sim (to measure AC current).



3. Remove power from the circuit under test and discharge all capacitors.
 4. Connect the meter's test leads in series with the circuit.
- Caution:** Do not apply voltage to the test leads while the selector is set to $\overline{\text{DC}}$ or \sim . The connection must be in series with the circuit.
5. Apply power and read the current.

If the measured current's polarity is negative, – appears before the value when you measure DC current, or ~ appears before the value when you measure AC current.

Note: The DC/AC mA function is fuse-protected. If the meter does not show a reading in this range, check the fuse (see “Replacing the Fuse” on Page 38).

MEASURING RESISTANCE

The resistance measuring circuit in your meter compares the voltage gained through a known resistance (internal) with the voltage developed across an unknown resistance.

Warning: Be sure the circuit under test has all power removed and any associated capacitors are fully discharged before you make a resistance measurement.

Resistance Cautions

When you measure resistance, the meter supplies voltage and current to the device you are measuring. The current applied by the meter could damage some devices (such as some integrated circuits).

This table lists the voltages and current supplied in each range of the meter. For each range, A is the open circuit voltage supplied by the meter, B is the voltage supplied by the meter when the measured resistance equals the range the meter is in, and C is the current supplied by the meter. (All values are measured at the meter's jacks and are typical.)

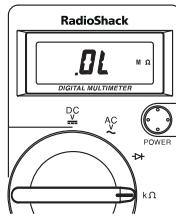
Range	A	B	C
400 Ω	2.99 V	315 mV	760 μ A
4 k Ω	0.86 V	183 mV	335 μ A
40 k Ω	0.58 V	164 mV	50 μ A
400 k Ω	0.57 V	165 mV	5.7 μ A
4 M Ω	0.53 V	165 mV	0.5 μ A

Caution: Before using the meter to measure a device's resistance, check the device's voltage tolerance.

Follow these steps to measure resistance.

1. Press **POWER** to turn on the meter.

2. Set the selector to $k\Omega$.



Caution: Your meter has a circuit to protect the resistance range from over-voltage (240V RMS AC for 1 minute). However, to ensure a correct measurement and avoid accidentally exceeding the protection circuit's rating, never connect the test leads to a source of voltage while the selector is set to $k\Omega$ or \rightarrow .

Note: With no resistance connected across the test leads (the measured value exceeds 4 $M\Omega$), .OL appears when you set the selector to $k\Omega$. This is normal.

3. Touch the test leads across the circuit you want to measure, or remove one lead of the component you want to measure from its circuit and touch the test leads to across the component. The proper range appears on the display.

Notes:

- If you are measuring resistance of about 1 M Ω or more, the display might take a few seconds to stabilize. This is normal.
- As with the voltage range, use the measuring units that appear on the display to determine the current resistance range. If only Ω appears, the values of the measurements are in ohms. If K and Ω appear, the meter is measuring kilohms (1 kohm = 1000 ohm). If M and Ω appear, the meter is measuring megohms (1 Mohm = 1,000,000 ohm).

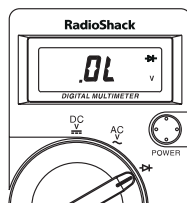
When you touch the ends of the test leads together, the meter selects the 400 Ω scale and displays a small value. This value is the resistance of the test leads. Note this value and subtract it from the measured value when you measure a very small resistance.

CHECKING DIODES

This procedure lets you check diodes, transistors, and other semiconductors for opens, shorts, and normal operation. It also lets you determine the forward voltage and polarity for diodes. (This is handy when you need to match a diode.) You can also check LEDs using this procedure.

Caution: Do not connect the test leads to a source of voltage when you set the selector to $\rightarrow\triangleright$. This could damage the meter or the circuit being tested.

1. Set the selector to $\rightarrow\triangleright$.



2. Remove power from the circuit under test.

3. Connect the test leads to the device you want to check, or remove one of the leads of the component you want to measure from its circuit and connect the test leads to the component.
4. Reverse the test leads and note the second reading.

This table shows the type and condition of the tested semiconductor device.

Diode Type	1st Reading	2nd Reading	Condition
Ge	0.2–0.4	.OL	Good
Si	0.5–0.7	.OL	Good
Ge/Si	.OL	.OL	Open
Ge/Si	Very small (about 0.1V)	Very small (about 0.1V)	Shorted

Notes:

- When you test a silicon type semiconductor, the values might vary depending on the temperature.
- The values that appear during the diode check show the actual forward voltage (max. 2.0V). if the voltage exceeds 2.0V, **.OL** appears and the diode check cannot be made.

Many diodes have a stripe or mark on one side. The marked side of the diode indicates the diode's cathode or negative (–) side. The other side is the anode or positive (+) side.

If a diode is not marked, you can use your meter to check the diode's polarity. As you follow the steps under "Checking Diodes" on Page 34, connect the red test lead to one side, connect the black test lead to the other side, then measure and note the voltage. Then reverse the test leads and measure and note the second reading. The side of the diode where the meter shows a higher voltage (using the red test lead) is the anode (+) side.

CARE

To enjoy your RadioShack 20-Range Auto-Ranging Digital Multimeter for a long time:

- Keep the meter dry. If it gets wet, wipe it dry immediately.
- Use and store the meter only in normal temperature environments.
- Handle the meter gently and carefully. Do not drop it.
- Keep the meter away from dust and dirt.

Modifying or tampering with the meter's internal components can cause a malfunction and invalidate its warranty. If your meter is not performing as it should, take it to your local RadioShack store for assistance.

CLEANING

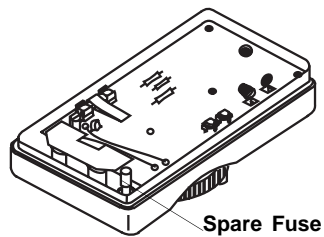
To keep the meter looking new, occasionally wipe it with a cloth slightly dampened with water. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the meter.

Warnings:

- Do not let any water drip inside the meter while cleaning it.
- Make sure that the meter is completely dry before using it.

REPLACING THE FUSE

If the meter does not work, you might need to replace the fuse with supplied spare fuse. The spare fuse is inside the top case.



If you need to replace the fuse again, use a 500 mA, 250V ceramic fuse (available at your local RadioShack store).

Caution:

- While the back case is removed, do not touch any of the components inside the meter other than as noted in this Owner's Manual. Doing so might damage the meter or change its calibration.
- Do not use a fuse with ratings other than those specified here. Doing so might damage your meter.

Follow these steps to replace the fuse.

1. Press **POWER** to turn off the meter. Then disconnect the test leads.

Warning: To avoid electric shock, you must disconnect the test leads before you open the battery compartment and the case.

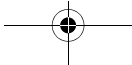
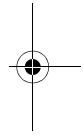
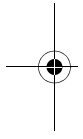
2. Use a Phillips screwdriver to loosen the screw in the battery compartment cover, then lift off the cover.

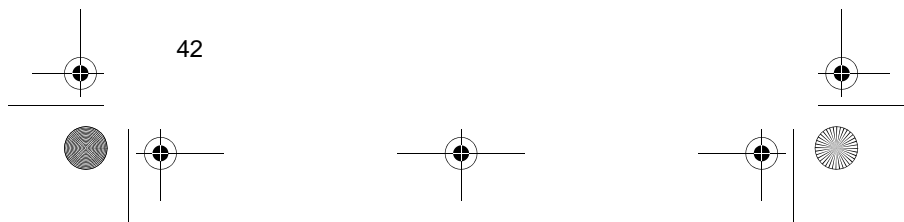
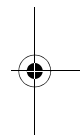
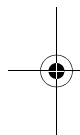
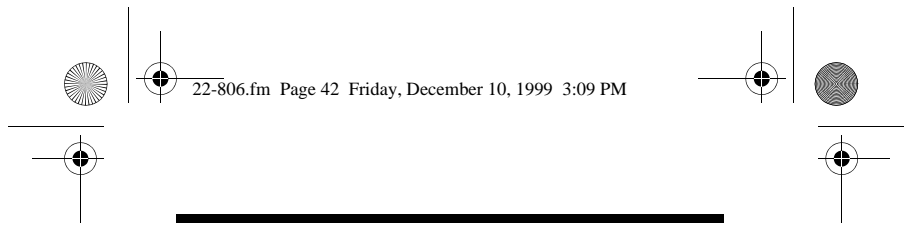
3. Remove the batteries.
4. Use a Phillips screwdriver to remove the screws in the back cover, then lift off the cover.
5. To remove the fuse, gently pull the red ribbon holding it. The fuse pops out.
6. If the fuse is blown, discard it and save the ribbon. Then remove the spare fuse and insert it into the fuse holder with the ribbon.
7. Replace the back cover and secure it with the screws.
8. Replace the batteries, then close the battery compartment cover and secure it with the screw.

Warning: Do not operate your meter until batteries are properly installed and the battery compartment cover is in place and secured.



NOTES





Limited Ninety-Day Warranty

This product is warranted by RadioShack against manufacturing defects in material and workmanship under normal use for ninety (90) days from the date of purchase from RadioShack company-owned stores and authorized RadioShack franchisees and dealers. EXCEPT AS PROVIDED HEREIN, RadioShack MAKES NO EXPRESS WARRANTIES AND ANY IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE DURATION OF THE WRITTEN LIMITED WARRANTIES CONTAINED HEREIN. EXCEPT AS PROVIDED HEREIN, RadioShack SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO CUSTOMER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS OR DAMAGE CAUSED DIRECTLY OR INDIRECTLY BY USE OR PERFORMANCE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, INCLUDING, BUT NOT LIMITED TO, ANY DAMAGES RESULTING FROM INCONVENIENCE, LOSS OF TIME, DATA, PROPERTY, REVENUE, OR PROFIT OR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF RadioShack HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

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(Continued) parts and products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

This warranty does not cover: (a) damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, lightning or other incidence of excess voltage or current; (b) any repairs other than those provided by a RadioShack Authorized Service Facility; (c) consumables such as fuses or batteries; (d) cosmetic damage; (e) transportation, shipping or insurance costs; or (f) costs of product removal, installation, set-up service adjustment or reinstallation.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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